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10/651,452	08/29/2003	Somashekar Ramachandran Subrahmanyam	109869-134067	8750

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EXAMINER	
JACOB, MARY C	
ART UNIT	PAPER NUMBER
2123	

DATE MAILED: 07/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/651,452	SUBRAHMANYAM, SOMASHEKAR RAMACHANDRAN	
	Examiner	Art Unit	
	Mary C. Jacob	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 August 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-51* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-51* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 August 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1/15/04,3/15/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-51 have been presented for examination.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-51 are rejected under 35 U.S.C. 112, first paragraph, because the best mode contemplated by the inventor has not been disclosed. Evidence of concealment of the best mode is based upon the following examples in the specification that leave it unclear as to whether applicant knew of the best mode of practicing the invention at the time the application was filed, and further, does not enable one skilled in the art to practice the best mode: (page 5, lines 1-26; page 9, lines 3-5, 21-29; page 10, lines 1-3, lines 18-20; page 11, lines 13-14; page 12, lines 8-10; page 14, lines 8-12; page 16, lines 13-14, lines 28-29; page 19, lines 15-21). These examples in the specification contain the following language that have raised questions as to whether the best mode has been set forth, "the order of description should not be construed as to imply that these operations are necessarily order dependent", "In various embodiments, the generation techniques being considered may include, but are not limited to", and "in various embodiments...".

3. Claims 1, 11, 21, 23, 25, 30-33, 36, 47-50 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

4. Claims 1 and 36 recites the term "generation technique", however, it is unclear as to what a "generation technique" is in this claim. Further, the specification states "In various embodiments, the generation techniques being considered may include, but are not limited to..." (page 9, lines 26-29) making it difficult to determine a definition to "generation technique"

5. Claims 1, 25, 32, 33, 36, 49 and 50 further recite the terms "selecting", "applying", "determining", however, it is unclear from the specification how the "selecting" of a generation technique, "selecting" valid ones of said faces, the "applying" of the generation technique, "determining within the computing environment" or others are done.

6. Claims 11 and 23 recites, "non-regularized". It is unclear from the specification what a "non-regularized" Boolean operation is.

7. Claims 21, 30, 31, 47 and 48 refer to the term, "wire body", however the term "wire body" is not disclosed in the specification, therefore, it is unclear as to what a "wire body" is referring to.

8. Claim 25, 32, 33, 49 and 50 recite the term "valid", however, it is unclear as to what "valid ones of said faces" refers to. The specification discusses

"invalid" faces, but not "valid faces", therefore, the meaning of this term is unclear.

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 1 and 36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

11. Claims 1 and 36 recites the term "generation technique", however, it is unclear as to what a "generation technique" is in this claim. Further, the specification states, "In various embodiments, the generation techniques being considered may include, but are not limited to..." (Page 9, lines 26-29) making it difficult to determine a definition to "generation technique".

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13. Claims 1-4, 7-11, 12, 15-39, 42, 45-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Subrashekar et al ("Feature Attributes

and Their Role in Product Modeling", Solid Modeling '95, Salt Lake City, Utah, 1995) and further in view of Computer & Automation Institute ("PROARC, No. 7831, CAD-Based Programming System for Arc Welding Robots in One-Off Production Runs", ESPRIT, 1/16.2001), herein referred to as CAI.

14. As to Claims 1-4, 7-11, 12, 15-39, 42, 45-51 Subrashekar et al teaches: in a computing environment, a method to generate solid models that includes: examining within the computing environment, facial characteristics of the faces of the components (sections 3.6 and 3.7); selecting within the computing environment, a generation technique based at least in part on the result of said examining and applying within the computing environment, the selected generation technique to generate a data representation of the solid model (sections 4.2, 4.3, 4.4, "Geometric Transformations", "Shape-Changing Operations", "Topology-Changing Operations"; Table 1 and description); examining within the computing environment, one of the faces to determine at least one of whether the face is planar and whether the face is cylindrical (section 3.6, line 9-10); examining within the computing environment, the faces of one component to determine whether the faces lie in a single plane (page 121, column 2, 2nd paragraph, "A full overlap..."); examining within the computing environment, a first face of a first component and a corresponding second face of a second component to determine whether the first and second faces are perpendicular (section 4.2, lines 14-18); wherein the applying comprises assigning within the computing environment, one or more attributes to the faces, including at least one of tracking attributes specifying the one or more attributes

are to be propagated during each of a split, copy and merge operation performed within the computing environment on data representations of the faces, and ownership attributes specifying ownership of the fillet weld bead by the faces (section 3.6; section 4.4, paragraph 1); wherein the applying comprises generating a blank, based at least in part on bodies referred to by the faces (page 117, column 2, paragraph 5, "The slot and the hole..." and Figure 5, "Starting Block"); constructing a profile based at least in part on faces of components of an article of a manufacture to be fillet welded together at the faces (section 4.4, paragraph 1); generating with the computing environment, a tool, based at least in part on a profile (page 117, column 2, paragraph 5, "The slot and the hole..." and Figure 5, "Starting Block"); wherein said applying comprises constructing within the computing environment, a trimmer body, and applying within the computing environment, a non-regularized boolean operation between the trimmer body and a tool (page 117, column 2, paragraph 5, "The slot and the hole..." and Figure 5, "Slot Feature Attributes", "Hole Feature Attributes"); conditionally trimming within the computing environment, the tool, with a data representation of the untrimmed tool to be initialized as a data representation of a model to be used to weld the components together at the faces if, trimming is not performed, and a data representation of the trimmed tool to be initialized as a data representation of a model to be used to weld the components together at the faces, if, trimming was performed (Figure 4, wherein the Slot Feature and Hole feature attributes are subtracted, therefore, trimming, the starting block attributes; wherein if the Slot and Hole features or any other

attributes were not present to be subtracted, the starting block would not be trimmed); assigning one or more attributes to other faces of the components specifying faces of the fillet weld bead are not to overlap with these other faces of the components (page 121, column 2, paragraph 3, "In Figure 7(c)..."); wherein the generating of a blank comprises locating, one or more bodies referred to by the faces (section 3.7, lines 1-6, lines 10-11; Figure 4, Design View); replicating within the computing environment, data representations of the located one or more bodies (Figure 4, "Slot feature attributes", "Hole Feature Attributes"); conditionally forming within the computing environment, a unified body, if, data representations of more than one body are replicated, and initializing within the computing environment, a data representation of a located body as a data representation of the blank if, only one body was located, and initializing within the computing environment, a data representation of the unified body as a data representation of the blank if, the conditional forming operation was performed (Figure 4, wherein the Slot Feature and Hole feature attributes are subtracted, therefore, trimming, the starting block attributes; wherein if the Slot and Hole features or any other attributes were not present to be subtracted, the starting block would not be trimmed); assigning one or more attributes to other faces of the components specifying faces of the fillet weld bead are not to overlap with these other faces of the components (page 121, column 2, paragraph 3, "In Figure 7(c)..."); comprises collecting one or more edges of a blank (section 3.6, lines 5-8, section); replicating within the computing environment, data representations of the located one or more edges (section 4.4, lines 9-15);

conditionally forming within the computing environment, a wire body if, data representations of more than one edge are replicated (Figure 6(b) and section 4.4, lines 12-17); initializing within the computing environment, a data representation of a located edge as a data representation of a path if, only one edge of a blank was located, and initializing within the computing environment, data representations of disjoint pieces of the wire body as data representations of one or more paths if, the conditional forming operation was performed (pages 120-121, "Splitting Operations"); sweeping the constructed profile within the computing environment to generate the tool (page 119, "Sweeping Operations"; section 4.3, paragraph 1); determining faces of the blank that are incident on the first and second points; selecting, valid ones of said faces copying and extending within the computing environment, the selected valid ones of said faces into bodies, and uniting within the computing environment, said bodies, to form the trimmer body(section 4.4, lines 12-15; page 121, "Merging Operations" paragraphs 1-4); transfer of attributes from edges of the profile to lateral faces of the tool (section 4.4, lines 5-15); selective boolean operation on the tool and a trimmer body (page 117, 2nd column, "The slot and the hole..."; Figure 4); and initialization of the result of the selective boolean operation as a data representation of the solid model (Figure 4); subtraction of a blank, created based at least in part on bodies referred to by the faces, from the tool, selective boolean operation on the result of the subtraction and a trimmer body and initialization of the result of the selective boolean operation as a data

representation of the solid model (page 117, 2nd column, "The slot and the hole..."; Figure 4).

15. Subrashekar et al does not expressly teach the solid model being a data representation of a fillet weld bead; generating one or more paths, based at least in part on edges of a blank; determining whether a path is open or closed; on determining the path is open, determining a start and an end point of the path; determining a first and a second point on a blank corresponding to the start and end points of the path.

16. CAI teaches the PROARC system, that is capable of simulating, generating and reusing entire or partial welding sequences for robot program generation and includes macros for fillet welds, that is implemented on the world-leading PC-based CAD system, AutoCAD that will enable the user to work with the new system effectively after a short time therefore, rising the productivity of the user (Section 1, paragraphs 3 and 4; section 3, paragraphs 1 and 2). Computer & Automation Institute further teaches the solid model being a data representation of a fillet weld bead and generating one or more paths, based at least in part on edges of a blank (section 3, 4th bullet; page 8, "GeomIMP; section 6.2, "Macro Definition for Seams", "Search Sequences"; page 19, "Program Generation Module, paragraphs 1 and 3; Section 8, 6th bullet); determining whether a path is open or closed on determining the path is open, determining a start and an end point of the path determining a first and a second point on a blank corresponding to the start and end points of the path (section 6.2, "Macro Definition for Seams", "Search Sequences").

17. Subrashekar et al and CAI are analogous art since they are both directed to the use of CAD in mechanical design.

18. It would have been obvious to one of ordinary skill at the time the invention was made to modify the method of generating solid models as taught by Subrashekar et al to further include the solid model being a data representation of a fillet weld bead, generating one or more paths based at least in part on edges of a blank and determining whether a path is open or closed, on determining the path is open, determining a start and an end point of the path, determining a first and a second point on a blank corresponding to the start and end points of the path as taught by CAI since CAI teaches the PROARC system, that is capable of simulating, generating and reusing entire or partial welding sequences for robot program generation and includes macros for fillet welds, that is implemented on the world-leading PC-based CAD system, AutoCAD that will enable the user to work with the new system effectively after a short time therefore, rising the productivity of the user (Section 1, paragraphs 3 and 4; section 3, paragraphs 1 and 2).

19. Claims 5, 6, 13, 14, 40, 41, 43 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Subrashekar et al and CAI as applied to claims 1, 12, 36, and 42 above, and further in view of Wang et al ("The Design and Fabrication of Welded Tubular Joints Using Solid Modelling Techniques", 2nd ACM Solid Modeling, 1993).

20. As to Claims 5, 6, 13, 14, 40, 41, 43 and 44 Subrashekar et al and CAI teach selecting within the computing environment, a generation technique based at least in part on the result of said examining and applying within the computing environment, the selected generation technique to generate a data representation of the solid model (sections 4.2, 4.3, 4.4, "Geometric Transformations", "Shape-Changing Operations", "Topology-Changing Operations"; Table 1 and description).

21. Subrashekar et al and CAI do not expressly teach the construction of a triangular or quadrilateral profile.

22. Wang et al teaches a unique interactive graphics software code which has been developed for the design and fabrication of tubular welded joints by a robotic welding system that is based upon planar boundary solid modeling techniques (page 430, Introduction, last paragraph). Wang et al further teaches the generation of a model of the two pieces to be welded together and of the weld itself, the model of the weld being of a triangular and quadrilateral profile (section 2.4 and Figure 8b).

23. Subrashekar et al and CAI and Wang et al are analogous art since they are both directed to solid modeling in mechanical design.

24. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the generation techniques as taught in Subrashekar et al and CAI to include the construction of a triangular or quadrilateral profile as taught by Wang et al since Wang et al teaches a unique interactive graphics software code which has been developed for the design and

fabrication of tubular welded joints by a robotic welding system that is based upon planar boundary solid modeling techniques (page 430, Introduction, last paragraph).

Conclusion

25. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

26. Taneja (US Patent 5774359 teaches generating an extended fillet surface with a computer which smoothly connects two base surfaces together based on the boundary curve of intersection between an offset of the first surface and an envelope of the second surface.

27. Gilliland et al (US Patent 6249718 teaches a method for automatically tracking the joint between a first component and a second component, or the edge of a component, in a welding operation.

28. Hoelle et al (US Patent 7050960 teaches a drafting system that automatically generates digital drawings from a computer generated model of a bracket.

29. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mary C. Jacob whose telephone number is 571-272-6249. The examiner can normally be reached on M-F 7AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Rodriguez can be reached on 571-272-3753. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Mary C. Jacob
Examiner
AU2123

MCJ
7/3/06

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